MDP Software Update

H4.2 Improvements and Added Capabilities

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Overview

- Addition of color display support (MFCD)
  - But TW-1 is not getting color until ~FY16
- CALT Option
- HUD Changes/Additions
- Steering Options
- HSI, Waypoint, and Sequence Changes/Additions
- Command Heading Marker
- Advisories

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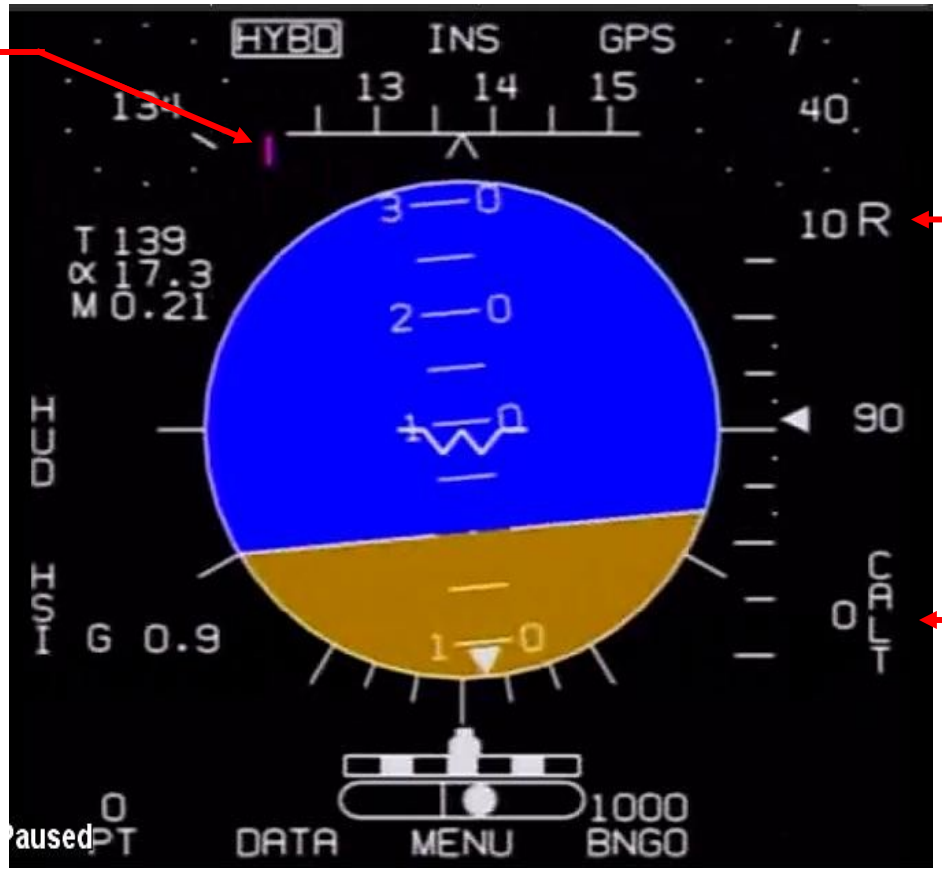
ADI

- ***ASC-013 additional options:***

Command Heading Bug

HUD Option



No leading zeros

Command Altitude in hundreds of feet

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CALT Option

- ***Commanded Altitude***
- ***Allows aircrew to enter an altitude via the DEP in increments of 100 feet from 0 to 40,000 feet***
- ***No connections to other systems / simply allows crew to display altitude assigned***
- ***Displayed next to CALT option***
- ***Used like we use the HDG Bug right now for altitudes***

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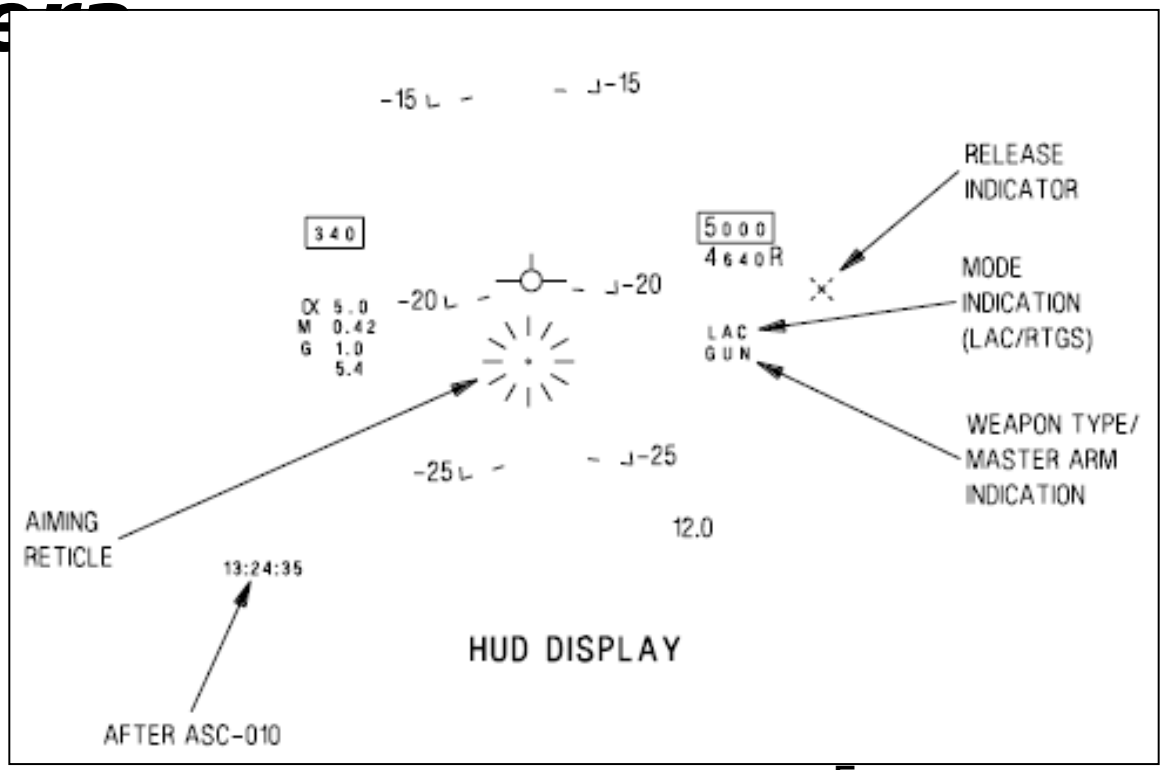
HUD Changes

- ***HUD Limited Velocity Vector***
- ***Waterline Symbol***
- ***HUD Came***



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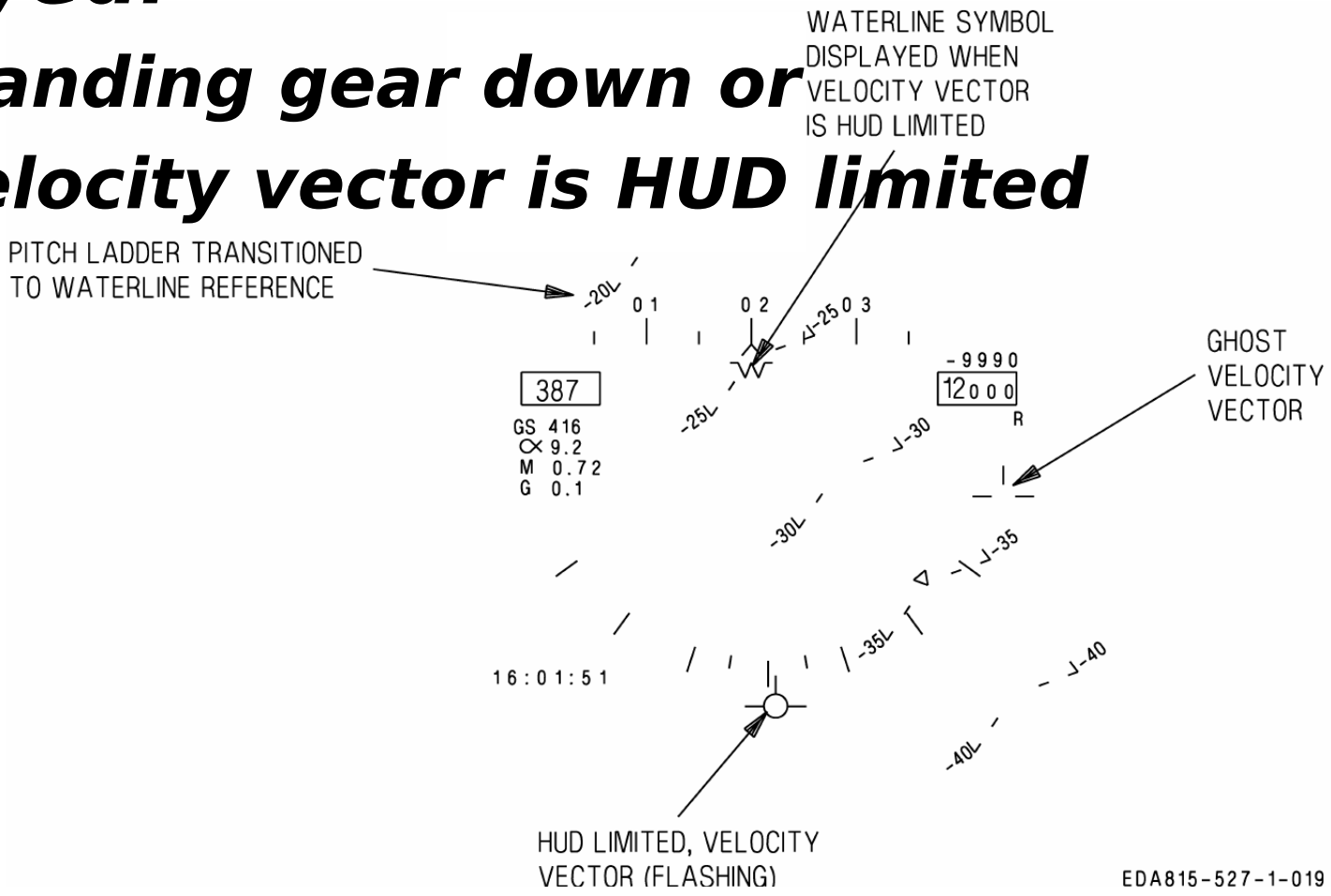
HUD Waterline

- ***HUD waterline Symbol is displayed:***
  - ***with landing gear down or***
  - ***the velocity vector is HUD limited***



HUD Limited VV

- Velocity Vector and Ghost Vector flash when HUD limited
- Pitch ladder is displayed relative to waterline
  - Velocity Vector becomes HUD Limited or
  - INS velocities are invalid
  - No flight path data is provided
- Pitch ladder slides from/to Velocity Vector to/from Waterline
  - Sliding transition takes 2 seconds
  - Waterline symbol is displayed with gear down or HUD limited VV

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HUD Repeater

- *"HUD" Option on ADI allows viewing raw HUD data directly on an MFD by selecting "HUD" on the ADI*
- *HUD video camera input on MFD can be "turned off" in order to view only HUD symbology and data by deselecting "CAM"*

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HUD Repeater (cont'd)

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HSI Changes

- HSI Symbology
  - 45 deg tics Removed, Mark Points, GREF
- Increased Waypoints (from 11 to 61)
- Additional Lat/Long formats
- Waypoint Offset PLAN/CDI Steering
- Support for up to 3 Flight Plans / SEQs
  - Sequential Waypoint Programming
  - AUT1, AUT2, AUT3 available
- Additional scale options on HSI
- Fuel remaining at waypoint overfly
- Command Heading Marker

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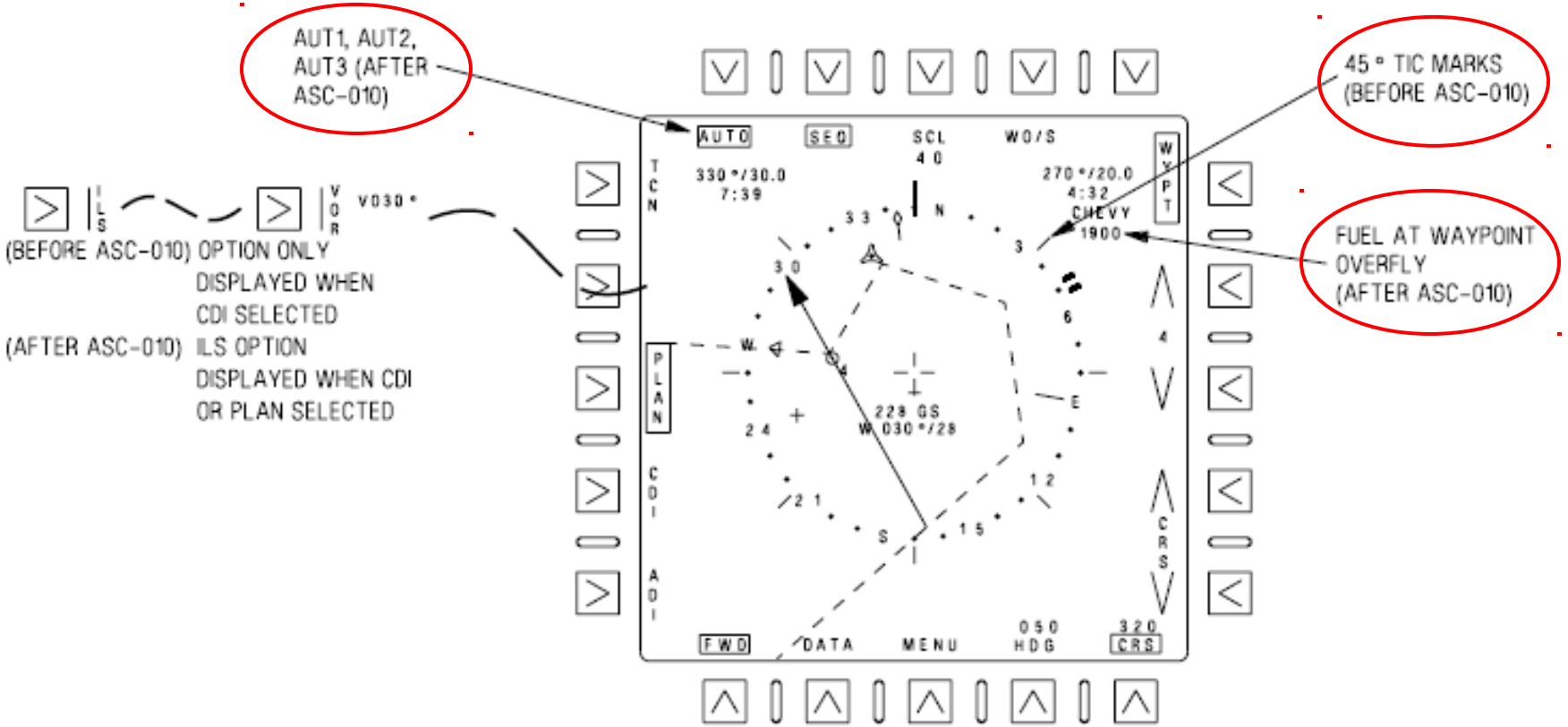
HSI



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HSI

AUTO advance for each sequence

Fuel Remaining at waypoint overfly

45 deg tic marks removed

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HSI Symbology

- Compass rose 45 deg tic marks are removed
- Up to 3 markpoint symbols may be stored as waypoints 61, 62, and 63 for use as MK1, MK2 and MK3
  - Displayed as: M1
- Geographical Reference (GREF)
  - Selected on waypoint sequence page and displayed as: 2 SEQ not required on HSI

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Increased Waypoints

- *61 Waypoints available (0-60)*
- *Also, 3 Markpoints (as previously stated)*

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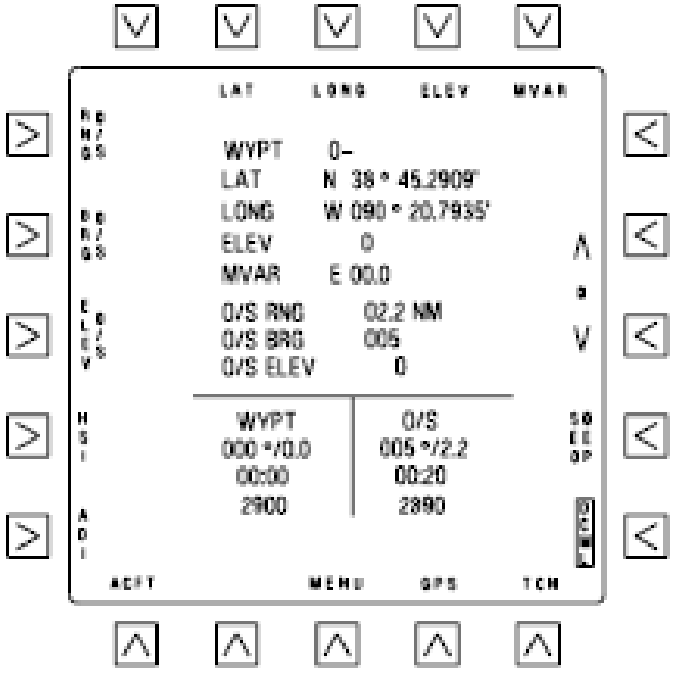
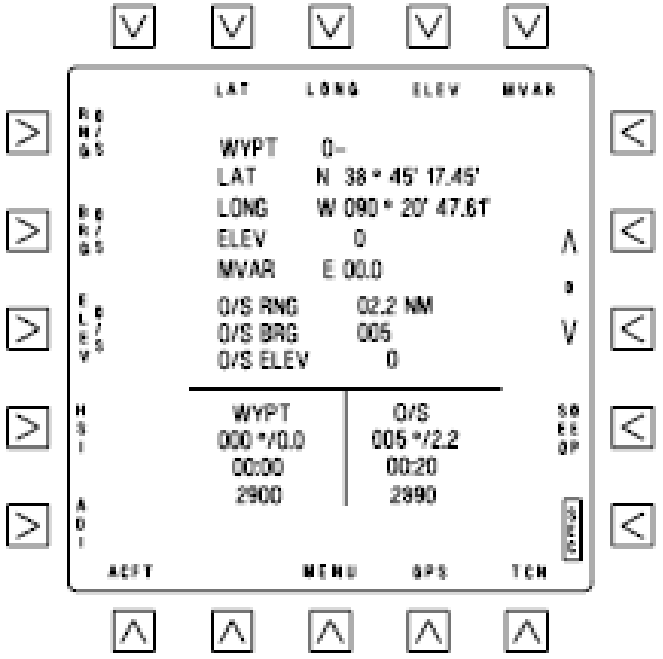
Additional LAT/LONG Formats

- **Latitude and longitude can now be:**
  - **Entered in decimal minutes (DCML)**



WAYPOINT DISPLAY PAGE

- DECIMAL MINUTES FORMAT



WAYPOINT DISPLAY PAGE

- DECIMAL SECONDS FORMAT

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Waypoint Offset PLAN /CDI Steering

- Entered by selecting PLAN then WO/S
  - Course is entered using CRS option
- Command steering marker is displayed on the ADI and HUD

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TACAN Offset Steering

- ***Similar to waypoint offset, but now to a TACAN station***
- ***Provides TACAN offset steering in either the PLAN or CDI modes and displayed as a cross symbol on HSI***
- ***Select TACAN display page to enter offset information***
  - ***Select TCN option from waypoint, aircraft or GPS display pages***
- ***Offset information includes:***
  - ***TACAN station elevation***
  - ***Offset range (RNG)***
  - ***Offset bearing (BRG)***
  - ***Elevation for offset location (ELEV)***
- ***Offset information is retained and applied (when TO/S selected) for any TACAN station selected until offset information is changed***

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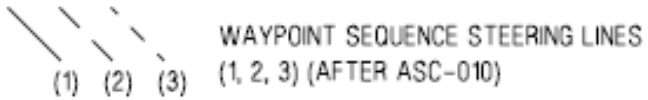
Three Sequences

- **Up to 3 sequences can be shown individually or simultaneously**
  - **SEQ1 displayed as a s**



  - **SEQ2 displayed as dashes**
  - **SEQ3 displayed as closely spaced dots**
- **Select SEQ option on HSI page**
  - **Sequences selected on sequence display page**

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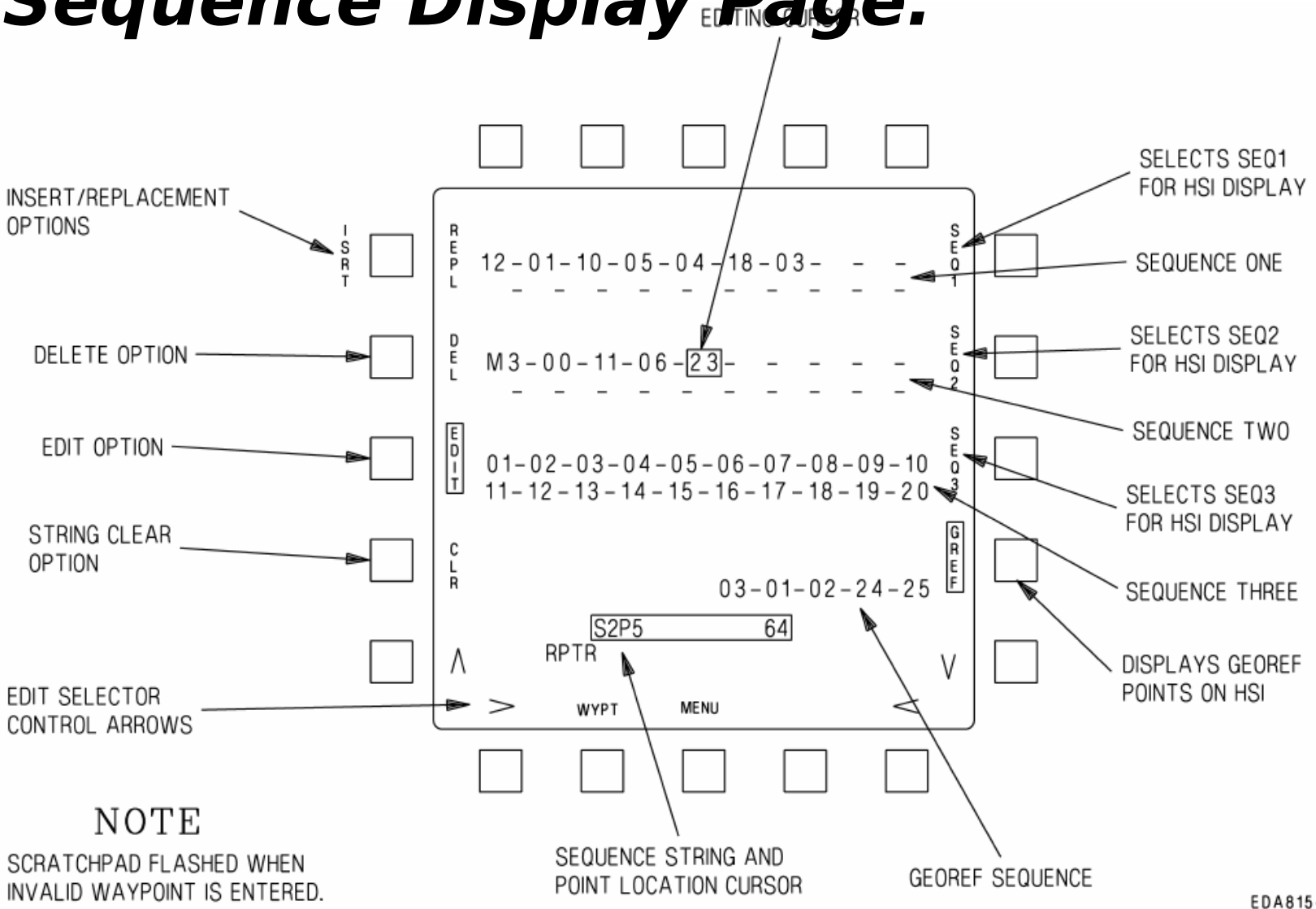
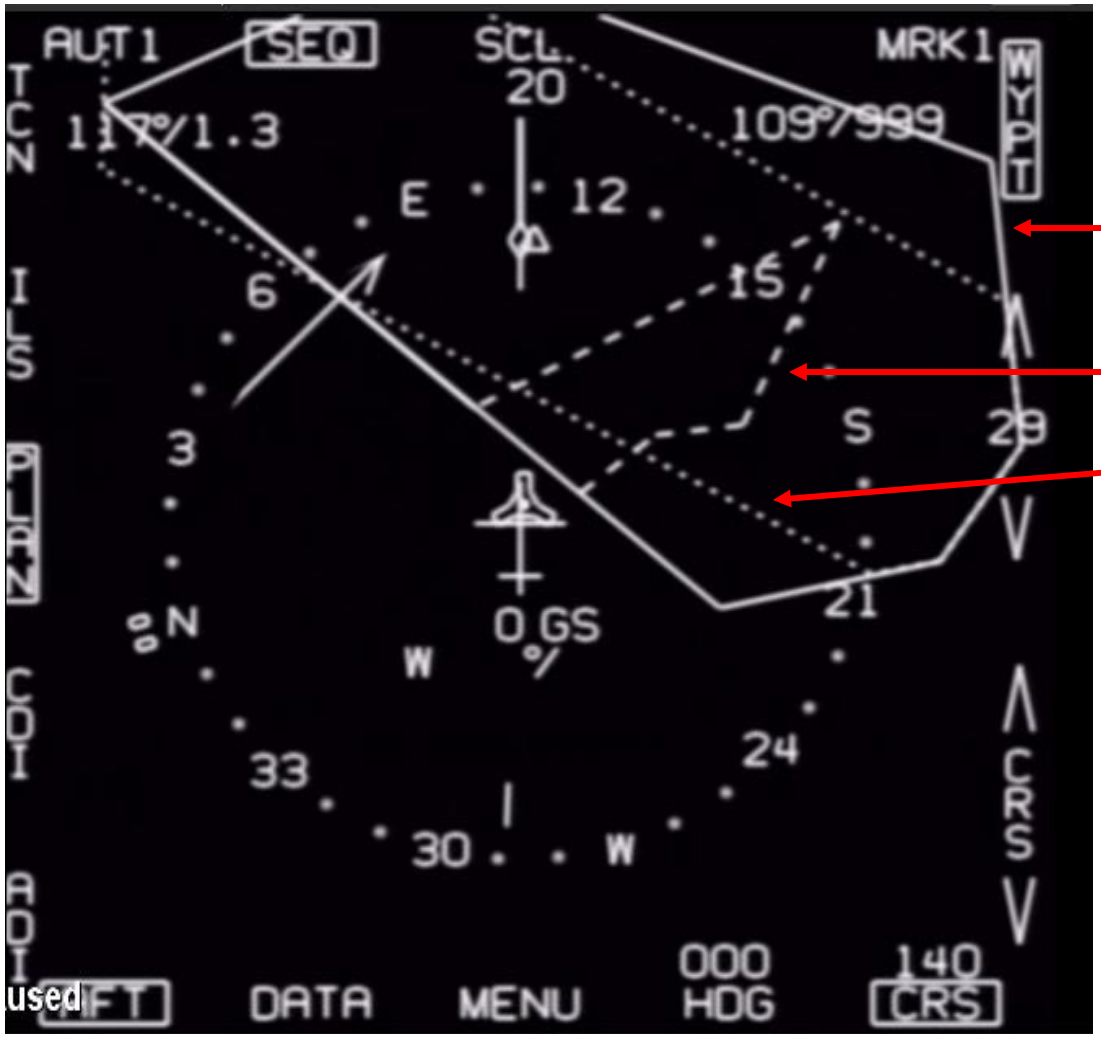
Sequential Waypoint Programming

- **Sequence Display Page:**



Sequential Waypoint Programming

Sequences 1, 2, & 3



SEQ1

SEQ2

SEQ3

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Sequence 2

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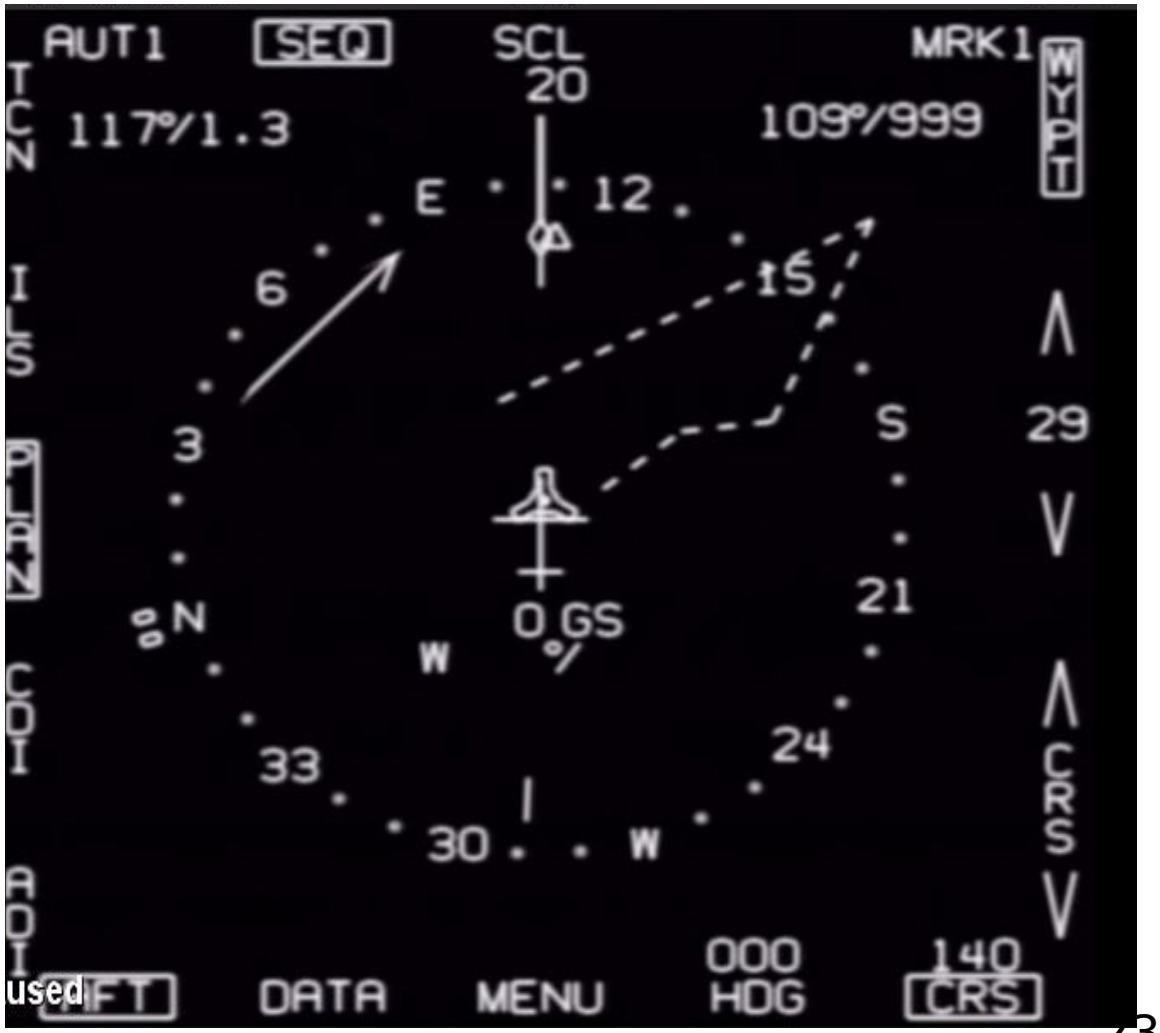
Sequence 3



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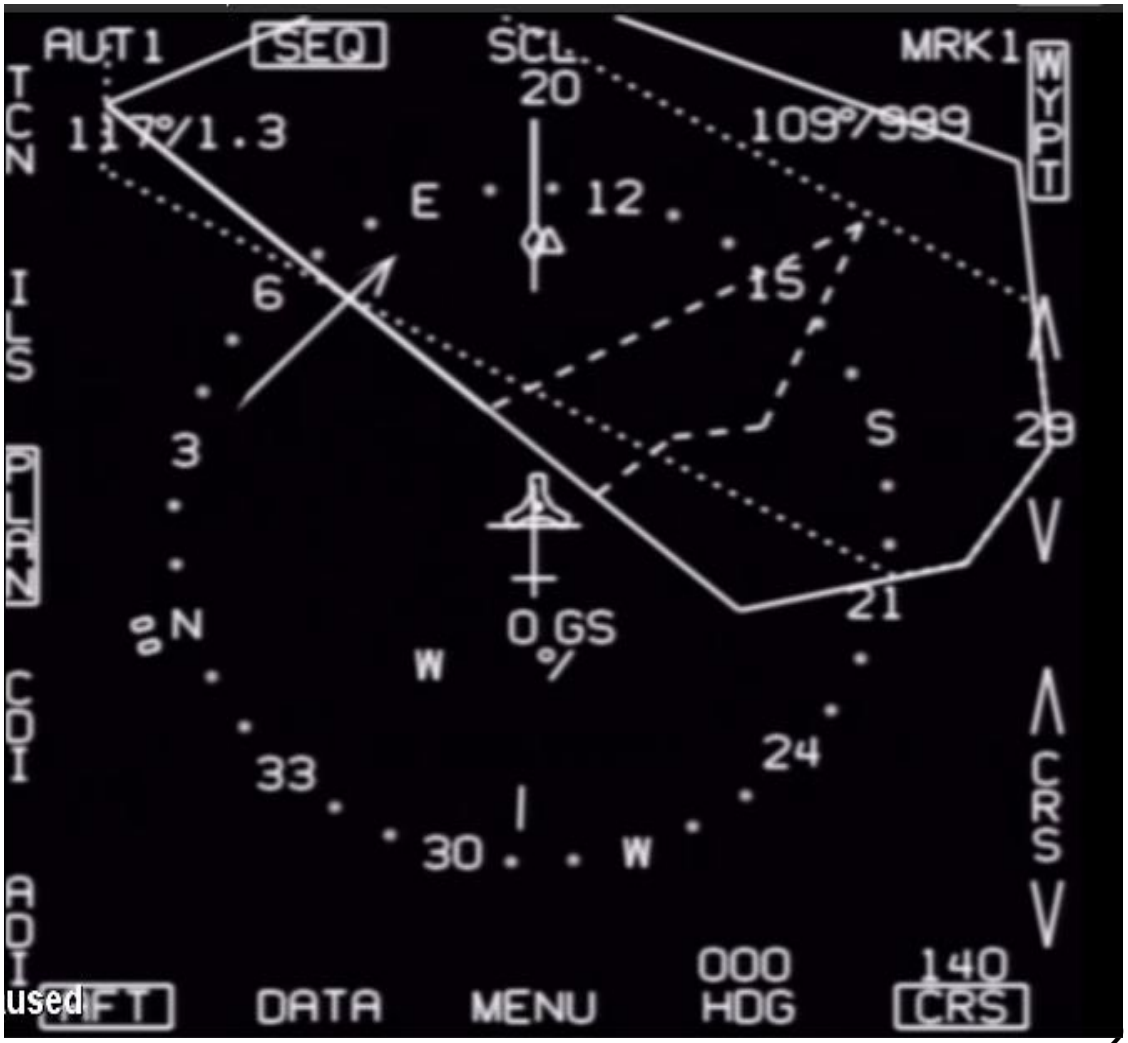
Sequences 1, 2, & 3



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Sequential Waypoint Programming

- Selected by pressing SEQ option on waypoint display page
- Up to 20 waypoints in each sequence
- Up to 5 waypoints in GREF sequence
- Waypoints can be inserted (ISRT), replaced (REPL) or deleted (DEL) by selecting EDIT option
  - Use edit selector control arrows to box desired waypoint number in sequence for above actions
- Box SEQ1, SEQ2, and/or SEQ3 in order to display on HSI page when SEQ is selected on HSI page
- Can select AUT1, AUT2, AUT3 corresponding to SEQ1, SEQ2, SEQ3 respectively

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HSI Scale Options

- ***Range scales now available:***
  - ***5, 10, 20, 40, 80, 160, and 320***
  - ***5 and 320 were added***

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Fuel Remaining

- ***Fuel remaining at waypoint overflight is displayed in the upper right hand corner of the HSI***

- ***Fuel remaining is based on current fuel flow, fuel quantity remaining and time to go to selected waypoint***

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Command Heading Marker

- ILS or no steering selected:
  - Marker indicates selected heading
  - Marker is NOT wind corrected in ADI and HUD
- Steering selected
  - Marker is wind corrected on ADI and HUD
  - VOR: location is based on VOR bearing
  - TACAN, TACAN offset, waypoint or waypoint offset: great circle steering to the NAVAID position
- Displayed anytime the steering arrow is displayed

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Miscompare Advisory

- **Advisory cue when INS and GPS outputs do not agree within threshold**
  - **Approx 6.5 ft/sec and 2,000 ft for about 25 sec**
- **MISCOMPARE now displayed on ADI**
  - **Removed when REJ option is selected**
  - **GINA will indicate DEGD on BIT page until INS and GPS velocities are within threshold**

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Failure Indications

- ***WRA BIT legend is flashed for 3 seconds in the lower right portion of the MFD***
  - ***If more than one failure occurs AV BIT is displayed***

<u>WRA BIT Legend</u>

Failure and indication are the same for the following:
RALT, GINA, DEU, HUD, ADR, IFF, SADS, YDS, MDL, ECA, VCR

<u>Failure</u>	<u>Indication</u>
LFWD MFD	LF MFD
RFWD MFD	RF MFD
LAFT MFD	LA MFD
RAFT MFD	RA MFD

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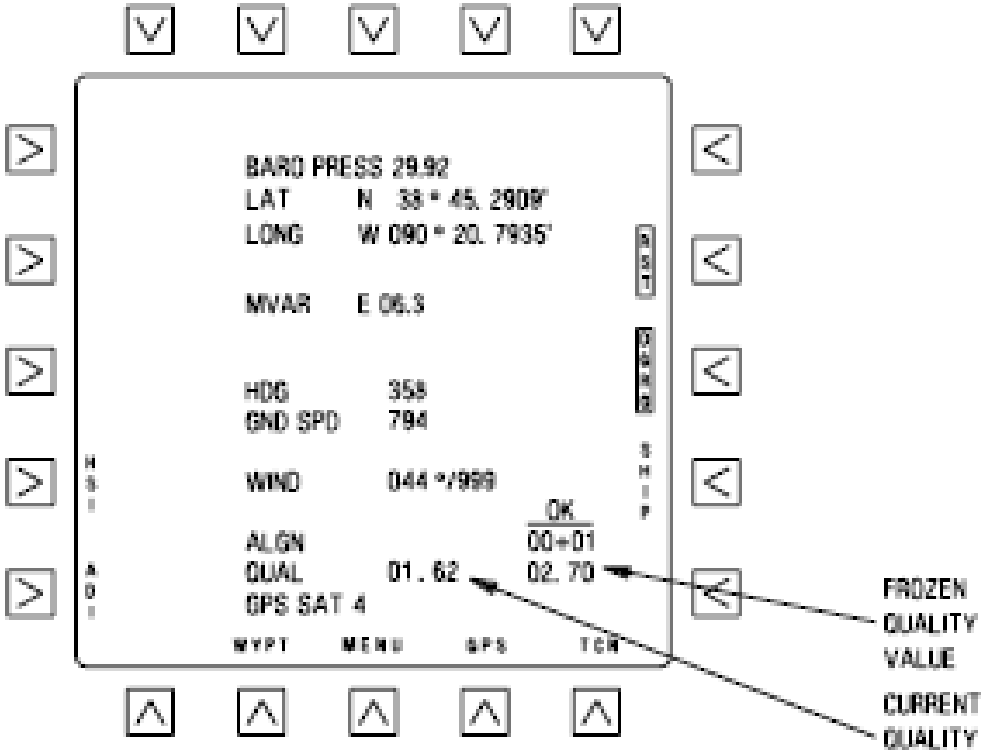
Additional GINA Alignment Data

- *GINA alignment data*



ACFT DATA SUBLEVEL

- GINA ALIGNMENT DATA (AFTER ASC-010)

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GINA SHIP Option

- ***Boxing SHIP option now begins ship alignment and boxes RST (restart)***
  - ***No need to manually restart GINA***
  - ***Must have:***
    - ***weight-on-wheels***
    - ***Incomplete alignment or***
    - ***DGRO (directional gyro) option selected w/ weight-on-wheels and true heading invalid***

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Questions?

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